DOI:10.34108/eujhs.1165927

SAĞLIK BİLİMLERİ DERGİSİ
JOURNAL OF HEALTH SCIENCES
Erciyes Üniversitesi Sağlık Bilimleri Enstitüsü Yayın Organıdır

Araştırma 2023; 32(2): 168-174

THE TURKISH VERSION OF BODY UNDERSTANDING MEASURE FOR PREGNANCY SCALE: VALIDITY AND RELIABILITY STUDY

GEBELİKTE VÜCUT ALGISI ÖLÇEĞİNİN TÜRKÇE UYARLAMASI: GEÇERLİK VE GÜVENİRLİK ÇALIŞMASI

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ABSTRACT

The objective of this study was to adapt the Body Understanding Measure for Pregnancy Scale into the Turkish language and to examine the psychometric properties in pregnancy. The methodological study was conducted with 508 healthy pregnant women. Language validation, content validation, and pilot scheme are the three phases of cultural adaptation of the scale. The construct validity of the scale was analysed using both Exploratory and Confirmatory Factor Analyses. The reliability of the scale was tested using parallel-form reliability, test-retest reliability, Cronbach's α coefficient of internal consistency, and item total correlation. The Confirmatory Factor Analysis conducted supports the three-factor structure of the scale that is constructed by Exploratory Factor Analysis. We determined Cronbach's α coefficient of internal consistency to vary between 0.78 and 0.88 for scale total and the subscales. Besides, there was a high correlation between the parallel-form reliability, test-retest reliability, item total correlation of the scale. The Turkish version of Body Understanding Measure for Pregnancy Scale is a validated and reliable tool designed to evaluate the body image concerns of Turkish pregnant women.

Keywords: Body image, Body Understanding Measure For Pregnancy Scale, Reliability, Validity

ÖZ

Bu araştırmada, gebelere uygulanacak şekilde Gebelikte Vücut Algısı Ölçeğinin Türkçe'ye uyarlaması ve gebelerdeki psikometrik özelliklerinin incelenmesi amaçlanmıştır. Metodolojik nitelikte tasarlanan bu araştırma, toplam 508 sağlıklı gebe ile yapılmıştır. Ölçeğin kültürel adaptasyon süreci dil geçerliliği, kapsam geçerliliği ve pilot uygulama olarak 3 aşamada gerçekleştirildi. Ölçeğin yapı geçerliğini test etmek amacıyla Açımlayıcı ve Doğrulayıcı Faktör Analizleri kullanıldı. Ölçeğin güvenirliği; cronbach's α iç tutarlık kat sayısı, madde toplam korelasyonu, test-tekrar test analizi ve paralel form güvenirliği ile değerlendirildi. Yapılan Doğrulayıcı Faktör Analizi, Açımlayıcı Faktör Analizi ile oluşturulan ölçeğin üç faktörlü yapısını desteklemektedir. Ölçek toplam ve alt boyutlarında cronbach's α iç tutarlık kat sayısının 0.78 ile 0.88 arasında değiştiği saptandı. Ayrıca, ölçeğin madde toplam korelasyonu, test-tekrar test analizi ve paralel formlar güvenirliği yüksek korelasyona sahipti. Araştırmada Gebelikte Vücut Algısı Ölçeğinin Türk gebe kadınlardaki vücut algısı düzeyini değerlendirmede kullanılabilecek geçerli ve güvenilir bir araç olduğu belirlenmiştir.

Anahtar kelimeler: Beden İmajı, Gebelikte Vücut Algısı Ölçeği, Geçerlik, Güvenirlik

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Makale Geliş Tarihi : 23.08.2022
Makale Kabul Tarihi: 14.03.2023

INTRODUCTION

Being a multi-dimensional construct, body image reflects the internalized self-perception of one's own body (1,2). It involves perceptions, thoughts, attitudes, and feelings about the physical characteristics of the body such as weight, shape, slimness, muscularity, sexual attractiveness, athletic shape, and functionality (1-3).

The shape, weight, and accordingly the appearance of the body changes during pregnancy and this makes the pregnant women focus on their bodies (4). The physical changes in question are related to women's satisfaction with body in their pregnancy periods, and the level of this satisfaction is determinative not only for the maternal physical wellness but also for the psychological health (4-6). Some researches revealed that rapid bodily changes such as skin color changes, gaining weight, fatigue, growing body, and growing breasts contradict social ideals and affect the pregnant women's body image perceptions (5-7). These changes also cause some pregnant women to perceive their body images positively, whereas they cause some others to be dissatisfied with their bodies (1,3,8,9).

Body satisfaction is a significant determinant of maternal-fetal health problems. The body dissatisfaction of a pregnant woman causes the feeling of inadequacy and significant negative results in the health and wellness of the individual such as antenatal and postnatal depression associated with inadequate nutrition and self-starvation (6,8,10). In the literature, body image distortion is related to negative maternal-fetal health factors such as low self-esteem, lack of self-confidence, distorted maternal-fetal attachment, eating disorders, obesity, low rates of breastfeeding, low birth weight, and maternal smoking (3,10-14). In this context, it is important to investigate the indications of the changes in body satisfaction depending on time and to make it clear how body satisfaction alters during the pregnancy period (4,11). Thus, it is necessary to assess the pregnant women's body image within the scope of antenatal care (9,15,16). It is important to define body image perception during pregnancy by using a validated and reliable tool. Although some researches show that there are extensive body image problems in Turkey, the information about body image during pregnancy are based on researches using general body understanding measurement scales (9,17-19). Nevertheless, since these scales are not designed specifically for pregnancy, they may miss certain worries about the changes in their body in this period which may cause a biased result (4). Moreover, the literature review revealed that Uçar et al. developed "The scale for body image concerns during pregnancy" in Turkey (2018) (20). However, the investigation of this scale showed that it does not consider the physical burden of pregnancy which is an important factor for body image in pregnancy as well as depression, anxiety, and self-esteem. Also, its application is limited to the 2nd and 3rd trimester and the discriminant validation is not conducted for this scale. Whereas, Body Understanding Measure for Pregnancy Scale (BUMPs), developed by Kirk and Preston in English (2019), (3) is the only fully verified scale for the measurement of body satisfaction that can be applied in all three trimesters. The body image during pregnancy is recognized as a global issue so the exploration of this subject requires universal measurement methods (3,11,21). Therefore, the use of universal methods needs to be verified to be appropriate for local applications. In this context, this research is conducted to adapt Kirk and Preston's BUMPs (2019) to the Turkish language.

MATERIALS AND METHODS

Study Participants and Design

This methodological research was carried out with the participation of healthy pregnant women who were admitted for monitoring to the obstetrics clinics of a university hospital in Turkey between November 2019 and February 2020. Researchers suggest that confirmatory factor analysis (CFA) and exploratory factor analysis (EFA) can be performed on the same sample. According to these authors, analyzes on the same sample provide to reveal the structure of the empirical data (22). In the process of adapting a scale to a foreign language, the sampling size is scored as poor for 100 samples, fair for 200 samples, good for 500 samples, very good for 500 samples, and excellent for 1000 samples (23). We aimed to include at least 500 women in the research and succeeded to have a sampling of 508 pregnant women for this study. The participants complying with the acceptance criteria are selected using a non-probability sampling method. The acceptance criteria are established as healthy pregnant women having no psychiatric illness and depressive symptoms. The researchers collected the data by face-to-face interviews.

Instruments

Personal Information Form

This form includes a series of questions including age, education level, working status, economic status, gestational age, parity, multiple gestation, and health problems during gestation.

Body-Cathexis Scale (BCS)

Secord and Jourard's (1953) "Body-Cathexis Scale" (BCS) was used to evaluate the parallel forms reliability of the "BUMPs". Hovardaoğlu (1993) carried out the Turkish validity and reliability study of the BCS and confirmed the scale in this regard (24,25). The BCS aims to measure individuals' satisfaction with their various body parts and body functions. There are 40 statements in this scale scoring the responses from 1 to 5. The scale results in a single point. The lowest possible point is 40 and the highest possible point is 200 where the increasing point in the evaluation indicates a higher satisfaction. The Cronbach's alpha is set to 0.91 for the Turkish adaptation (24). In the present research, Cronbach's α was determined as 0.84.

Body Understanding Measure for Pregnancy Scale (BUMPs)

The Body Understanding Measure for Pregnancy Scale, developed by Kirk and Preston (2019), is a 5-point Likert scale designed to investigate the body satisfaction of any pregnant women without regarding the trimester phase. The BUMPs is the first fully verified scale that can be applied during all trimesters of pregnancy. The scale has 19 items that are divided into three subtitles as; satisfaction with appearing pregnant, weight gain concerns, and physical burdens of pregnancy. The scoring is between 1 and 5, the mini-

mum possible point is 19, and the maximum possible point is 95. The increasing measurement score implies more body dissatisfaction. The scale does not have a cut off point, and its Cronbach's α reliability coefficient was reported as 0.91 (3).

Procedure

Translation, content validity, and pilot study

The BUMPs was translated into Turkish during the language validation phase by the authors of this study, 2 expert linguists, and 2 lecturers. Two expert linguists re-reviewed the translated scale questions and compared them with the original version.

For the content validity, the Turkish and original versions were forwarded via e-mail to 11 lecturers for their assessment (2 midwives, 6 obstetrics and gynaecology nurses, 2 psychiatric nurses, 1 public health nurse). Davis technique was used to evaluate expert opinions in the content validity study (26). The coherence level among the expert opinions is assessed with Kendall's W analysis (27). The experts' scores were found to be statistically not divergent (Kendall W=0.136; p>0.05) and the expert opinions were determined to be coherent.

After organizing the BUMPs per the expert opinions, the pilot scheme of it was applied to 50 pregnant women. The findings obtained from the pilot scheme were added to the research data. The pilot scheme proved that there was no misunderstood statement in the questionnaire. This step finalized the adaptation of the Turkish version of BUMPs.

Psychometric testing of the BUMPs

Validity

Construct validity of the scale was tested using factor analysis. Before that, the Kaiser-Meyer-Olkin (KMO) test was conducted to check the sampling sufficiency, and Bartlett's Sphericity Test to analyse the sample size. The KMO coefficient is required to be 0.50 or over and the Bartlett's Sphericity Test is required to yield a statistical significance for the sample size to be adequate for the factor analysis (28).

Principal Component Analysis, one of the common techniques for factor analysis, was used to analyse the factor structure of the BUMPs and the data were analyzed using the varimax method. After EFA, CFA was carried out to support the findings corresponding to the subscales.

Reliability

The reliability of BUMPs is evaluated using parallel-form reliability, item total correlation, test-retest reliability analysis, and Cronbach's alpha coefficient of internal consistency.

The item total correlation coefficients were used to investigate the relationship between the test total score and the scores for the BUMPs test items.

The BUMPs is re-applied to 55 pregnant women after 2 weeks for the test-retest reliability analysis of BUMPs. The consistency of the scale across time was evaluated by test-retest correlation (29).

Parallel-form reliability was assessed by administering the original version of the scale and its adapted version to the same group in one or two sessions. This reliability coefficient gives information for the concurrent validity. Body-Cathexis Scale is used for this purpose. The correlation between the two versions of the scale was computed by Pearson' correlation (29).

Data analysis

The research data is evaluated using the SPSS 23.0 and AMOS 23.0 (30). This software is used to obtain the descriptive statistics of participants' defining characteristics such as frequencies, percentages, means, and standard deviations. It is also applied in analysing the psychometric properties of the BUMPs. The statistical significance was set at p<0.05.

Ethical Issues

Before the adaptation of the "Body Understanding Measure for Pregnancy Scale" in Turkish culture, we exchanged e-mails with Kirk and obtained the required permissions. We received the written permission of the institution where the research was conducted. In addition, a University Ethics Committee approved this study with registration number 2019/207.

RESULTS

The pregnant women's mean age was 29.9±5.4 and the mean gestation age was 26.2±9.8 weeks. Besides, it is determined that 69.5% of them were unemployed and 28.1% of them were high-school graduates. The percentage of pregnant women who declared to have a balanced budget was 42.7% which was equal to the ones who declared to have a deficit budget (Table I).

Table I. Descriptive Characteristics of the Pregnancy (N = 508)

Socio-Demographic Characteristics	n (%)
Age (years) (Mean ± SD)	29.91±5.47
Gestational age (weeks) (Mean ± SD)	26.25±9.87
Occupation	
Unemployed	353 (69.5)
Employed	155 (30.5)
Educational Status	
Literate or No Education	76(15.0)
Primary school	79(15.6)
Middle School	70(13.8)
High school	143(28.1)
University undergraduate degree or higher	140(27.6)
Family Income	
Low	217(42.7)
Moderate	217(42.7)
High	74(14.6)
Parity	
Multiparous	393(77.4)
Primiparous	115(22.6)
Multiple Gestation	19(3.7)
Trimester	
First trimester	66(13.0)
Second Trimester	137(27.0)
Third Trimester	305(60.0)
Health problems	
Yes	90 (17.7)
No	418 (82.3)

Validity

The pregnant women's KMO coefficient was calculated as 0.858 with the KMO analysis, and the $X2$ value was calculated as 5081.59 with Barlett's Sphericity Test (p <0.001). The evaluated results showed that the size of

the sample was suitable and adequate for the factor analysis.

EFA, conducted to validate the 19 item BUMPs for pregnancy, yielded factor loading of 0.73-0.87, 0.63-0.83, and 0.52-0.83 for the subscales "physical burdens of pregnancy", "weight gain concerns", and "satisfaction with appearing pregnant", respectively. It also explained the 59% of the total variance, 29% of "satisfaction with appearing pregnant" subscale variance, 19% of "weight gain concerns" subscale variance, and 9% of "physical burdens of pregnancy" subscale variance (Table II).

Thereby, we achieved the BUMPs with three subscales and 19 items. The fit indices for CFA of the 19 item BUMPs were calculated as follows: $X2$=1390.9, df=149 (p<0.05), $X2$/df=9.33, RMSEA=0.128, NFI=0.79, HOELTER=117, GFI=0.73, CFI=0.75 and IFI=0.75 (Table III). After recognizing that these results did not reflect a good fit, the modification advises were examined and high error covariance was identified between items 1 and 6, 1 and 9, 4 and 10, 8 and 11, 8 and 19, 11 and 19, 3 and 17, 5 and 7, 5 and 16.

The error covariances of the related items were related, so the 2nd CFA model was applied. Following the amendment, CFA fit indices were calculated as follows: $X2$=558.120, df= 140 (p<0.05), $X2$/sd=3.98, RMSEA=0.07, GFI=0.90, CFI=0.91, and IFI=0.91. The model revealed a fit at acceptable level after the amendment (Table III).

CFA Path Diagram of BUMPs after the second CFA modeling is depicted in the Figure 1.

Reliability

The internal consistency values were calculated as 0.88, 0.87, 0.78, and 0.85 respectively for the "satisfaction with appearing pregnant" subscale, "weight gain concerns" subscale, "physical burdens of pregnancy" subscale, and total internal consistency (Table IV). The BUMPs total, "satisfaction with appearing pregnant" subscale, and "weight gain concerns" subscale were found highly reliable and the "physical burdens of pregnancy" subscale was found quite reliable (p≤0.001).

Table II. The Item Total Correlations and Factor Loadings for the BUMPs in Pregnant Women

Scale items	Satisfaction with appearing pregnant	Weight gain concerns	Physical burdens of pregnancy	Mean(SD)	Corrected item-total correlations
19	0.83			2.6(1.3)	0.38
11	0.81			2.9(1.2)	0.39
8	0.76			2.9(1.2)	0.39
1	0.75			2.5(1.1)	0.55
15	0.71			2.4(1.1)	0.59
6	0.68			3.0(1.2)	0.40
10	0.63			2.6(1.1)	0.68
4	0.63			2.7(1.2)	0.42
9	0.52			2.4(1.2)	0.54
16		0.83		2.6(1.2)	0.47
5		0.81		2.7(1.3)	0.43
13		0.80		2.5(1.1)	0.53
7		0.74		2.9(1.2)	0.40
3		0.71		2.5(1.1)	0.63
14		0.65		2.7(1.2)	0.34
17		0.63		2.6(1.1)	0.47
18			0.87	3.2(1.3)	0.22
12			0.87	2.7(1.1)	0.27
2			0.73	2.1(1.0)	0.31
%Variance Explained	29.20	19.95	9.91	Total = 59.07	

Table III. CFA Fit Indexes for the Pregnant Women

	Model 1	Model 2
X2	1390.991	558.120
df	149	140
X2 /df	9.33	3.98
RMSEA	0.128	0.07
GFI	0.73	0.90
CFI	0.75	0.91
IFI	0.75	0.91
NFI	0.76	0.79
HOELTER	109	117

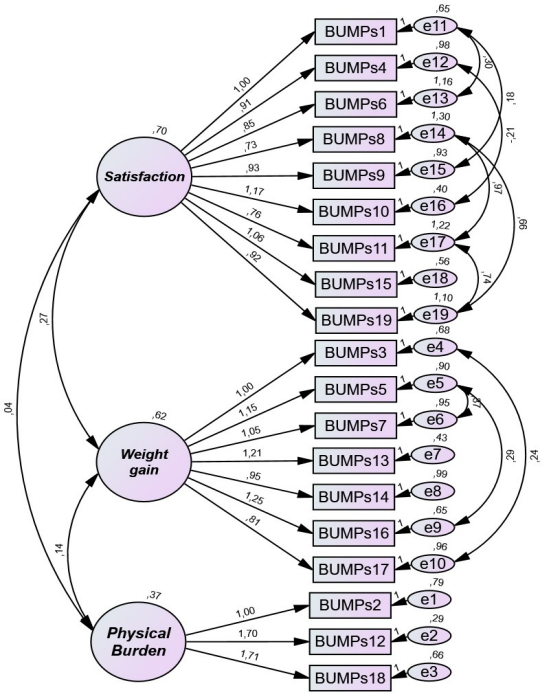

Figure I. Model of The Factor Structure of Body Understanding Measure for Pregnancy Scale in Pregnancy.

Tablo IV. Descriptive statistics for the total BUMPs and its sub-scales

BUMPs	Cronbach's α	Mean ± SD (min/max)
Satisfaction with appearing pregnant	0.88	45.0± 24.51(min:9/max=45)
Weight gain concerns	0.87	18.83± 6.44(min:7/max=35)
Physical burdens of pregnancy	0.78	8.19± 2.98(min:3/max=15)
BUMPs total	0.85	51.54 ± 12.09 (min=19/max=95)

The item total correlation coefficients of the BUMPs were also evaluated and calculated as ranging from r=0.22 to r=0.68 which implied an acceptable level for the pregnant women (Table II). It was found that each item and the total score were statistically significantly correlated (p=0.000).

In this research, the correlation between the average scores of the 1st and the 2nd application (2-week interval) of the BUMPs was calculated to range from r=0.80 to r=0.85 (Table V). We identified a statistically significant (p=0.000), positive and strong relationship between BUMPs total and all subscales.

Table V. The Relationship between BUMPs test-retest and BCS Score Averages.

	Test Mean ± SD	Retest Mean ± SD	βTest-Retest	£BCS
BUMPs Total Score	51.54±12.9	52.56±9.24	0.80	-0.37
Satisfaction with appearing pregnant	24.51±7.91	25.56±5.84	0.85	-0.21
Weight gain concerns	18.83±6.44	17.73±5.55	0.84	-0.35
Physical burdens of pregnancy	8.19±2.98	8.73±2.19	0.80	-0.18

βn =55
£ n = 508

The BCS correlation results of the BUMPs total and all subscale average scores (r=-0.18- -0.37) showed a negative, weak, and statistically significant relationship between them (p=0.000).

DISCUSSION AND CONCLUSION

In this research, Kirk and Preston's (2019) BUMPs was adapted into Turkish. CFA and EFA were carried out to check the construct validity of the Turkish version of the BUMPs. This research complied with the assent that suggests a minimum factor loading of 0.30 of EFA and also suggests eliminating the items below this value (31,32). We identified no item with a factor loading below 0.30 after validating with EFA. Thus, all items were preserved in the scale. The outcome of the EFA of the adapted scale displayed a consistency with the outcome of original scale (3). Both versions, the Turkish and the original, consisted of 3 subscales and explained 59% of the total variance. Since this research regards the ≥30 threshold for variance ratio as explained in previous sections, the scale was assessed to achieve the construct validity (33). CFA supports the three-factor structure of the scale obtained by EFA. The fit indexes were analysed to evaluate the suitability of the model that was built with CFA (31,33-35). The evaluation did not conclude a good fit according to the literature where it is stated that $X2/df \leq 3$ implies an excellent fit and $3< X2/df \leq 5$ implies a good fit. The RMSEA value of 0.08 or below is an acceptable level. Besides, the GFI, CFI, and IFI values of 0.90 and above are acceptable values in data fit indices of the model (31,33-35). In this scope, the analysis results ($X2$/df, RMSEA, GFI, CFI, and IFI values) indicate a poor fit. The program recommended modification indices towards correlating the error covariances of some items. Making such modifications in the main model is recommended for increasing the initial model fit degree (36). In the modification indices recommended by the program, by choosing the 9 item pairs with the highest values (items 1-6, items 1-9, items 4-10, items 8-11, items 8-19, items 11-19, items 3-17, items 5-7 and items 5-116), the error terms of these items were correlated, and the model was tested again (37). After that, the modification suggestions were examined, and the error covariances were associated to apply the 2nd CFA model. After the amendment, the CFA fit indices were calculated as follows: $X2$=558.120, df= 140 ($p<0.05$), $X2$/sd=3.98, RMSEA=0.07, GFI=0.90, CFI=0.91 and IFI=0.91. After the amendment, the model displayed a fit at acceptable level.

The Cronbach's α coefficient of internal consistency technique is suggested for Likert-type scales. The reliability coefficient of a measurement tool is assessed to be as close as possible to 1.00 for adequacy. The measure scale is considered unreliable in case Cronbach's α value is less than 0.40, lowly reliable in case it is between 0.40 and 0.59, quite reliable in case it is between 0.60 and 0.79, and highly reliable in case it is between 0.80 and 1.00 (27,38). The internal consistency coefficient of "satisfaction with appearing pregnant" subscale was 0.87, "weight gain concerns" subscale was 0.86, "physical burdens of pregnancy" subscale was 0.78. Cronbach's α coefficient of internal consistency of a measurement instrument is required to be as close as possible to 1.00 for the adequacy (27,38). With this understanding, we can assess the internal consistency coefficient of the "physical burdens of pregnancy" subscale as quite reliable (p=0.001). Likewise, we can assess the internal consistency coefficient of BUMPs total and all other subscales as highly reliable. Kirk and Preston (2019) determined the Cronbach's α coefficient of internal consistency for the original model's subscales between 0.74 and 0.85. So we can conclude that the findings of this research are similar to the results of the original scale (3).

In this research, for item selection, the item total correlation coefficients were found to be higher than the acceptable level (≥0.20) and the values were within the range of r=0.22-0.68 (27, 39). The high correlation coefficient for each item shows that the related item is effective and adequate enough for measuring the in-

tended behaviour (27,39). In this research, we identified that each item and the total score were statistically significantly correlated (p≤0.001). The correlation coefficients of the factors in the original scale were ranging from r=0.29 to r=0.53. So, the findings of this study are similar to the original scale in terms of item total correlation coefficients (3).

If a measuring tool is applied to participants at different times, and if their answers display a consistency, that scale is defined to be consistent across time (40). The BUMPs was re-administered to 55 pregnant women after 2 weeks for the test-retest reliability, and it was found that there was a strong, positive, and significant relationship between BUMPs total and all subscales. The findings showed us that the scale for the pregnant women had a high internal consistency and they also proved that this scale can provide reliable results in multiple applications.

The increase in the score of BCS that is used to assess the parallel forms reliability indicates an increase in the positive evaluations (24). Yet, the increase in the score of the BUMPs means a decreasing level of body image during pregnancy (3). We identified a negative, low level, and statistically significant (p≤0.001) relationship between the average scores of BCS, BUMPs total, and all its subscale correlation values (r=-0.18- -0.37). The parallel forms correlation of the BUMPs in pregnant women is found to be at a good level. It also shows that they measure similar structures and have adequate concurrent validity.

In the literature, it has been seen that Satir and Hazar adapted the scale to Turkish (2022). In this study, sampling was reached online with Instagram, facebook and whatsapp applications. In our study, data were collected by face-to-face interview method. In addition, the original scale consists of three factors and 19 items. However, in the study of Gülec and Hazar, the Turkish version of the scale consisted of two factors and 17 items (41). They associated concerns about physical burdens of pregnancy, which is an important feature of body image during pregnancy, with weight gain. However, physical burdens of pregnancy is not just about weight gain. An important factor for physical burden of pregnancy is the musculoskeletal endurance of the pregnant woman. Even if the body mass indexes of those who exercise regularly are high, they experience less physical mobility problems (42). Therefore, our study is important in terms of providing a direct assessment of physical burden of pregnancy, which is an important factor in pregnancy. In our study, it was seen that the scale adapted to Turkish was compatible with the original. The universal acceptance of body image in pregnancy necessitates that the measurement tools to be used in the screening of this problem should also be considered universally. Our study concluded by preserving the universality of the scale.

The result of this study displayed a consistency with the results of the analyses carried out for the original scale. These results showed a good fit for the Turkish version of the BUMPs and confirmed that this scale is a validated and reliable instrument to assess the body image in pregnancy.

Conflicts of interest

There are no conflicts of interest

Financial support and sponsorship

Nil.

Acknowledgment

The authors would like to thank all pregnant women

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